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ABSTRACT

Six articles by Lynn Olson, published in various issues of "Education Week" starting in January 1993 and ending May 1995, describe a Maryland project to improve elementary education in the State: (1) "Winning NASDC (New American Schools Development Corporation) Project Takes Flight" (the basic skills children need to succeed in elementary school and a redesigned curriculum setting forth high standards in English, mathematics, science, history, and geography); (2) "For Maryland Reform Project, World Becomes Lab" (attempts to integrate concepts from science, geography, government, and history into new curricula); (3) "Math Project Takes Wings" (project designed to move students beyond rote application of basic skills); (4) "Family Ties" (family-support team at every school, school-based health clinics, and after-school tutors); (5) "Ready to Soar" (how much schools in St. Mary's County (Maryland) have changed); and (6) "Scaling Up the Design" (the project is about to be implemented nationwide). (MAH)

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Roots and Wings.
An *Education Week* Occasional Series

Education Week

January 1993 - May 1995

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ROOTS AND WINGS

01/20/93 WINNING NASDC PROJECT TAKES FLIGHT
(file name is 09roots)

Roots and Wings focuses on equipping children with the basic skills needed to succeed in elementary school, or the "roots" of the program. The "wings" are added by redesigning curriculum so that every child is expected to meet high standards in English, mathematics, science, history, and geography.

06/09/93 FOR MD. REFORM PROJECT, WORLD BECOMES LAB
(file name is 10roots)

After winning its second NASDC contract, Roots and Wings hopes to integrate concepts from science, geography, government, and history to replace traditional curricula.

12/15/93 MATH PROJECT TAKES WINGS
(file name is 11roots)

Like the other components of Roots and Wings, Math Wings is designed to move students beyond the rote application of basic skills.

12/07/94 FAMILY TIES
(file name is 12roots)

The family-support component of Roots and Wings includes a family-support team at every school, school-based health clinics, and after-school tutors.

05/17/95 READY TO SOAR
(file name is 13roots)

After three years of the Roots and Wings program, how much have schools in St. Mary's County, Md., changed?

05/17/95 SCALING UP THE DESIGN
(file name is 14roots)

After its trial run in St. Mary's County, Md., Roots and Wings is about to soar nationwide.

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Winning NASDC Project Takes Flight in Md.

By Lynn Olson

Lexington Park, Md

St. Mary's County juts into the Chesapeake Bay between the Potomac and Patuxent rivers, a place better known for its annual oyster festival than for its schools.

But in the next five years, this rural community hopes to become the breeding ground for a new generation of elementary schools that will be so visibly superior to what now exists that they will be replicated across the United States.

The project is known as "Roots and Wings," and it is the collective brainchild of a team of researchers at Johns Hopkins University, officials in the Maryland Department of Education, and teachers and administrators here.

Last August, their design was one of only 11 selected nationally for funding by the New American Schools Development Corporation, out of nearly 700 proposals.
American business leaders launched the multi-million-dollar nonprofit corporation in 1991, at the request of President Bush, to help foment a "revolution" in education by financing the design and replication of a group of "break the mold" schools.

"Their mission," the corporation proclaimed in an advertisement announcing the award winners, "is not merely to reform what already exists, but to start with a clean sheet of paper and rethink everything about American education and how it must work in the 21st century."

But the leaders of the St. Mary's County project, like most members of the design teams recognized by NASDC elsewhere, cannot start from scratch. They must work with the schools they have. This is the story of that effort.

The phase-one contract for Roots and Wings, signed last month, is for $992,775. Contracts with all of the NASDC design teams were completed as of last week.

`Gone to Heaven'

When Elfreda Mathis, the principal of Lexington Park Elementary School here, heard that Roots and Wings had been awarded a NASDC contract, "I had to go outside and get some air," she recalled recently.
"I thought I had died and gone to heaven," she chuckled. But these days, she admitted, "I'm kind of overwhelmed."

A large woman who attracts children like a magnet as she sails through the halls of her building, Ms. Mathis had begun drafting a New American Schools submission on her own before being approached by the St. Mary's County school district about joining the Roots and Wings team.

The project's genesis dates back to several phone calls between Robert C. Embry Jr., the chairman of the Maryland state board of education; Nancy S. Grasmick, the state superintendent of schools; and Robert E. Slavin of Johns Hopkins, one of the nation's most prominent educational researchers.

It was Ms. Grasmick who identified St. Mary's County as one of the more progressive districts in the state and one that might be willing to work with the researchers from Johns Hopkins, a private university in Baltimore. The district had already planned to submit a NASDC proposal of its own and had an energetic new superintendent of schools.

For Ms. Mathis, it was the appeal of working with a major research university that finally won her over. Lexington Park Elementary is a one-story brick building with three mobile classrooms on the side to cope with overcrowding. Fully half of its 516 students turn over each year, in part because of the military bases and low-income neighborhoods from which the school draws. Approximately 40 percent of its students are from minority groups, primarily African-American.

"When you're in a school where kids are floating in and out," Ms. Mathis explained, "you need a strategy to hold on to."

Draws on Research

The strategy that Roots and Wings offers is grounded, in part, on more than two decades of research by Mr. Slavin and his colleagues at Johns Hopkins University's Center for Research on Effective Schooling for Disadvantaged Students.

Working in some of the most poverty-stricken schools in the United States, they have demonstrated that early reading failures among children can be virtually eliminated by applying a high- quality curriculum that enables children to work in teams and that provides aggressive one-on-one tutoring, family-support services, and other assistance to children who are falling behind.

Until now, most of Mr. Slavin's efforts have focused on equipping children with the basic skills needed to succeed in elementary school, or what he refers to as the "roots" of the Roots and Wings program.

But the NASDC project will also provide children with "wings," by redesigning curriculum and instruction so that every child is expected to meet world-class standards in English, mathematics, science, history, and geography.

This agenda, which requires reconstituting whole schools around new and more ambitious standards, is far more demanding than anything that the research center has previously undertaken.

Reaching Out to Families

In Roots and Wings schools, children will work in groups based on their abilities and interests, not their age. The schools will reach out to students and their families from birth to identify youngsters who need special assistance before they begin school.

Starting at age 4, the project organizers say, every child will have the opportunity to participate in a "language rich" preschool and kindergarten program built around thematic units.

Retaining students in a grade will not be considered. If children are having trouble keeping up, they will be given tutoring, family-support services, and other assistance to help them master the content. They may also take more time to finish a learning block.

But the same high standards will be held for everyone, the organizers stress, with the resources and time needed to meet them--rather than outcomes--allowed to vary by child.

To secure this vision, every school will operate as a "family- development center," combining federal, state, and local resources to serve families in need.

`WorldLab' Simulations

One of the most ambitious features of the design is a project known as "WorldLab": a series of elaborate simulations that will enable students to work in teams to solve problems that are rooted in "real world" contexts.

In WorldLab, explained Yael Sharan, an expert on group investigations who is co-directing its development with her husband, Shlomo, "the kids get to investigate issues that they are interested in investigating."

"The point," she said, "is to lead them to the stage where they can say, `This is what we'd like to learn. This is

the question we'd like to investigate.'"

Rather than having students answer questions by rote, WorldLab will encourage them to solve problems creatively and flexibly and to apply the knowledge they have gained from a variety of subject areas.

For example, teams of students might collect data on the contamination of a nearby stream that is contributing to the pollution of the Chesapeake Bay. Their report, presented in both graphic and narrative form, might be based on water samples from the stream, interviews with area residents, telephone calls to local environmental experts, and library research using disk- based encyclopedias and computer data bases on the bay and its tributaries.

Back in the classroom, the students might present their findings in the form of "testimony" to an elected "town council" of their peers.

The children might also identify imaginary families and businesses that could be affected by the stream's pollution. While completing their research, they might learn songs about the bay and read a novel describing how pollution affects the 11- year-old son of a waterman.

These kinds of long-range, multidisciplinary projects, which will draw heavily on the use of computers and other technologies, will replace the existing science and social-studies curricula in the four participating elementary schools.

"We want to make real changes in the style of instruction and in what kids are involved in for the bulk of the day," explained Nancy A. Madden, a senior research scientist at the Johns Hopkins center.

Later this winter, teachers and researchers hope to pilot a small segment of WorldLab in some 5th-grade classrooms in the Roots and Wings schools.

Roots and Wings schools are also revamping their math curricula to bring them into line with the standards of the National Council of Teachers of Mathematics, which emphasize problem- solving, hands-on learning, and teamwork.

A Good Starting Point

In some ways, St. Mary's County provides fertile ground in which to sow such schools. When it comes to family support and integrated services, said Lawrence J. Dolan, a research scientist at Johns Hopkins, "we have as much to learn from St. Mary's County and the state as we can probably provide them."
Under state law, every school in the county already has a "pupil- services team" that meets regularly to provide case management for students who are having trouble in school. Several of the schools are also located near publicly or privately funded family-support centers that provide one-stop shopping for parents and children in need of social services.

At the state level, Gov. William Donald Schaefer has made the integration of services for children and their families one of his top priorities through the creation of a subcabinet for children, youths, and families. The body is headed by Ms. Grasmick, the state superintendent.

Changing Old Ways

But a walk through the halls of any of the four Roots and Wings elementary schools--Lexington Park, Green Holly, Ridge, and George Washington Carver--suggests that for many teachers, the project will require difficult, even wrenching, changes in how they do their jobs.

Although some teachers are experimenting with team teaching, cooperative learning, and multi-age grouping, others can be seen lecturing in the front of the room, or working with small groups while the other students fill out worksheets, chat with their neighbors, or gaze into space.
The huge amount of time that students typically spend on such inefficient and often uninspiring "seat work" is

one of the primary reasons that Mr. Slavin developed his cooperative- learning strategies.
Much of the fall was spent in a delicate courtship between teachers in this rural community, who are proud of their schools, and researchers from the university, who are trying to understand what they have to build on.
At a meeting with teachers earlier this school year, Anna Marie Farnish, one of the university's principal liaisons with the district, tried to reassure educators.

"We saw some wonderful things at your school that we're not planning to do away with," Ms. Farnish told them.

But some teachers remain skeptical--including several of those who have been seen as the most innovative in the past. One teacher, who asked not to be identified, said: "I deal with gifted kids. I'm not sure this answers their needs."

"For those kids who are already doing well," this teacher stated, "I can see that, in cooperative learning, they're going to be a great help to other children. But are they going to learn at their own level? That's just a concern to me, as a parent and as a teacher."

Ann Shumaker, a Chapter 1 remedial-education teacher at Ridge Elementary School, said: "Part of me is in that grant. I wrote sentences, and it's exciting to me."

"I want to see change," she added, "but I want to take the best of St. Mary's County also. That's the frustration that we are feeling right now: how to fit in what [the researchers] have proven successful to what we already have." `You Have To Think About It'

Some of that integration is beginning to take place at schools like Lexington Park Elementary.
In Chris Jensen's reading class one day recently, 4th- and 5th- grade students paired up with a partner to alternate reading paragraphs aloud from a text. There was a constant hum of activity as students quietly read an excerpt and corrected each other's mistakes.

Once they were done, the partners began a "treasure hunt"-- looking for the answers to questions and making predictions based on the text and discussing them with each other.

Each student then wrote down his answers individually. If a team was stymied, the partners could turn to another pair of students working nearby for assistance before going to the teacher.
By working in teams, every student had a chance to speak and to participate most of the time. And the process was one that the class seemed to enjoy.

After his partner attempted to answer a question on the treasure hunt, one boy retorted: "That ain't got nothing to do with the question. You don't have to get it from the book. You have to think about it."
Another student corrected a teammate's spelling of the word H.U.N.D.E.R.D.: "Nope, because `red' is R-E-D. Just listen." According to Mr. Jensen, the students like the structure provided by the Johns Hopkins exercises. And the discipline of having to listen to others' views and defend their own has resulted in sharper thinking.
"Their oral reading is a lot better, because they're correcting one another," Mr. Jensen said. "Their comprehension, I think, has improved by 80 percent, because they're into this game of challenging each other."

"They're asking critical questions," the teacher continued. `They're asking the `why' questions. And I think that will transfer to other subjects."

Structure Worries Some

One initial source of tension between the university scholars and some teachers was whether the Johns Hopkins approach might be too structured and rigid.

In the area of beginning reading, some teachers also worried that the program was too phonetically based--stressing the sounds of individual letters and syllables as a key component of reading instruction.
In a series of meetings last fall, Johns Hopkins researchers and St. Mary's educators tried to work out how to mesh their two approaches.

The university has also provided teachers with training, so that they can try out new instructional strategies "risk free" this year and adapt them to their schools' needs.

According to Ms. Madden of Johns Hopkins, some of the teachers who were most concerned initially about the researchers' approach to reading instruction have become "strong advocates" after trying it out in their own classrooms.

"They found that kids are proceeding very well," she said, "and that the phonics core has filled a gap." That view was seconded by teachers like Mr. Jensen, who said, "I think teachers are a lot more comfortable with it, because you see the results."

Beginning in mid-October, Lexington Park entirely reorganized its reading instruction in grades 1-5. Students are now grouped and regrouped by reading level--rather than age--every eight weeks, and no teacher has more than two reading levels in a classroom.

The time set aside for language arts has been expanded from 60 to 90 minutes. And children who are having the most difficulty receive 20 additional minutes of tutoring a day. Kindergarten and pre-kindergarten teachers are also incorporating some of the Johns Hopkins methodologies into their classrooms.

Christin Berryman, a Chapter 1 teacher at the school and a facilitator for the project, said, "We actually had children that jumped a year's reading level on paper--from pre-primer to primer to 1st grade--in just eight weeks."

In addition, said Ms. Mathis, the Lexington Park principal, behavioral problems and referrals at the school have decreased, because students are more engaged and are placed more appropriately.

Janice Walthour, the principal of the George Washington Carver Elementary School, who supports the new approach, said: "We cannot run our school on one or two master teachers. I want to see teachers have a structure that they can pull from that is sound."

Like Lexington Park, Carver has a highly transient student population. Last year, it had a 60 percent mobility rate--the highest in the county. Nearly half of its students are eligible to receive free or reduced-price lunches; some 42 percent are from minority groups, primarily African-American.

The neighborhood school, built in 1960, was originally one of two all-black high schools in the county. Lockers still line the walls in one wing of the red-brick building.

Away From `Labeling'

In contrast, Green Holly Elementary School is a brand-new building with more than 600 students that draws from a mixture of upper-middle-class and low-income communities. Teachers half- jokingly comment that they run a mile every day just to navigate around the school building.

The school also houses the district's program for the severely and profoundly handicapped, which draws students from across the county.

Teachers at Green Holly decided to pilot the Johns Hopkins approach to beginning reading in only one classroom this year, with students who were having the most difficulty with traditional reading instruction. "Probably this school is taking a more cautious approach than the other three," Principal Mary Blakely said. "We're not totally sure that Johns Hopkins has the answer in this area; but if they do, we want to use it." To Ms. Blakely, a former special-education teacher, the primary attraction of Roots and Wings was to get away from labeling too many students as "slow" or "handicapped" and pulling them out of mainstream classrooms. "I saw a lot of kids in high school who had been steeped in failure," she said.

A `No-Fault Year'

Technically, this year was supposed to be a planning year for the project. But teachers and researchers have found themselves operating on two tracks at once.

With assistance from Johns Hopkins faculty members, many teachers, such as those at Lexington Park, have begun trying out new approaches to cooperative learning and literacy instruction.

The majority of teachers at the four schools also have volunteered to participate in work groups that meet monthly to develop specific aspects of the Roots and Wings design. At Johns Hopkins, separate committees that correspond to these groups are working feverishly to develop more detailed prototypes and plans. This summer, a large number of the schools' teachers will be hired to work at Johns Hopkins full time to flesh out the final curriculum materials and strategies.

In addition, the state education department has assigned a full- time liaison to provide technical assistance and brokering for the project.

In part to allay teachers' fears, all of the school principals involved, as well as Joan Kozlovsky, the superintendent of the county school district, have emphasized that participation in the project is purely voluntary this year.

By next year, both teachers and students will attend the four schools by choice; those who disagree with the approach will be free to transfer elsewhere in the district.

"This is almost a no-fault year," stressed Michael Metz, the principal of Ridge Elementary School, a small neighborhood school with 260 students and 11 teachers. "We're going to put [Roots and Wings] into practice as much as we can, and kinks are going to come up."

"Our goal is not to wipe out the progress that we've made," Ms. Kozlovsky added, "but to inculcate the good things and make our programs and their programs merge."

`Walking to Kansas'

For now, the question is: How much change, how quickly, can the four schools accommodate?
"We confidently expect that many of the things we try will fail," Mr. Slavin told teachers and parents during a ceremony to launch the project in September. "If we didn't, we wouldn't be pushing the envelope."
"But there's a unique opportunity to do things here without having to worry about the way things have always been," he added.

Five years from now, Ms. Kozlovsky said, "I don't expect people to look at St. Mary's County and see four schools that have spotlights on them."

Instead, the superintendent is hoping to use school-improvement teams at each school, combined with the state's new performance- based assessments, to push for changes throughout the system.

Similarly, state officials are hoping that, in subsequent years, some of the money that the new-schools corporation raises for replication will flow Maryland's way to help spread the design to other parts of the state.

"It's not like climbing Mount Everest, where you're not sure if you'll get to the summit," Mr. Slavin said about the project.

"It's more like walking to Kansas," he said. "You know you'll get there, but it's a long way."

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For Md. Reform Project, the World Becomes a Lab

By Lynn Olson
St. Mary's City, Md.

On a beautiful afternoon in May, the red-brick walls of Maryland's reconstructed State House of 1676 reverberate once more with the sounds of argument. Delegates and senators jump to their feet to defend their proposals for saving the Chesapeake Bay. Citizens rise up to voice their displeasure.
But despite the intensity of the debate in the historic setting here, none of the representatives to this model general assembly is more than 11 years old. The two-day simulation of a real state legislature marks the culmination of months of work for these children from the St. Mary's County school district.

It is also a milestone in the development of "Roots and Wings," an ambitious plan for revamping elementary schools nationwide that was given birth here by researchers from Johns Hopkins University, local teachers and administrators, and officials of the Maryland Department of Education.

Last week, the project won its second contract from the New American Schools Development Corporation, a private, nonprofit group created by businessmen to underwrite a string of innovative schools across the country.

To prepare for their "legislative session" last month, the St. Mary's students have since February learned about the ecological, economic, and political life of the Chesapeake Bay region; conducted science experiments to assess the bay's health; role- played the lives of families and workers who earn their living from its waters; took field trips; researched topics that interested them; kept records and journals of their experiences; ran campaigns and elected political officials; and, finally, wound up here with drafts of bills based on what they had learned.

The activities were all part of "BayLab," a pilot thematic unit for 4th and 5th graders. It is the precursor to an integrated science and social-studies curriculum, called "WorldLab," that is designed to move children beyond basic skills by connecting their schoolwork to real life.

Eventually, its founders hope, the hands-on integration of concepts from science, geography, government, and history will replace existing elementary school curricula in those areas and become an integral part of the school day.

"We're hoping that it will be the kind of learning that will really make an impression on children," said Stan Bennett, an expert on simulations who helped develop the social-studies component. "Rather than just learning facts, [we hope] that children will really process the information and it will become personally important and significant to them."

Other components of Roots and Wings--which is being piloted in four of the district's elementary schools--include a family- development center designed to assist needy children, starting at birth, and their parents; a language-rich preschool and kindergarten, built around thematic units; completely revised reading, writing, and mathematics curricula, focused on cooperative learning and one-on-one tutoring; and a commitment to have all children perform at grade level and in the regular classroom. (See Education Week, Jan. 20, 1993.)

But it is WorldLab that the designers envision giving students "wings" to soar beyond the basic skills, by challenging them to apply their knowledge through role-playing, simulations, and group investigations.

"The idea of WorldLab as we see it," Robert Slavin, the project director and a researcher at Johns Hopkins University, explained, "is to try to design instruction that is relevant to kids--or that can be made relevant--by simulating things that exist in the real world."

`Fun' the Operative Word

Two months before the model general assembly, Juanita Mattox's 5th-grade classroom at Lexington Park Elementary School was overflowing with activity.
In one corner, two girls mapped the nine rivers that flow into the Chesapeake Bay. In another, a group of students tested designs and materials for model boats, which they later raced. The students then charted their results, along with step-by-step instructions for building the ships.

In the back of the room, a boy was identifying preserved fish with the help of a field guide. And in the far corner, three students were playing a game called the "Great Fish Race," in which they used calculators and playing cards to track the fate of a school of 100,000 fish through various natural and manmade disasters.

A visitor also encountered a student sifting through newspapers for articles about pollution in the bay, a child working on a computer, a group constructing jumping frogs using origami techniques, and several science experiments in progress.

In one such experiment, students built a model watershed using cardboard and foil, then watched the effect as water washed coffee grounds (to represent sediment) and KoolAid powder (to represent toxins) down a mountain and into the wetlands.

For Roots and Wings students, the operative word is "fun." The word, too often absent from the school lexicon, is heard again and again in youngsters' discussions about BayLab.

"It's better than social-studies books," Karen Carpenter, a 5th grader at Lexington Park, said, "because the books are really boring and a drag. This way, you get to do things and go places and really prove it."

`Families' and `Occupations'

Indeed, the students at Lexington Park Elementary are eager to talk about their work and, in particular, about their "families" and "occupations."

At the beginning of the unit, each student was assigned an imaginary family and a job--as a waterman, a county planner, or a developer, for example--with a monthly salary. The students then conducted research about their occupations. And several times a week, they drew "life event" and "business activity" cards that mirrored the kinds of financial ups-and-downs that befall real families and businesses. They also kept running tabs of their family budgets.

"I'm 30 years old, and I have a 3-year-old child, and I'm single," said Rob Bray, leafing through the "family album" that he put together with pictures from magazines. "I have a guest room," he announced, "and this is my son Zachary. He's eating at my restaurant."

"And that," he said, pointing to a picture, "is my ex-wife."

Then, he trumpeted, "I think I'm the second-richest kid in the class."

"It's a lot funner," the 5th grader said of the program, "a lot more interesting. We get to do more hands-on experiments."

Journals and Brainstorming

The shelves along one wall in this 5th-grade classroom at Lexington Park are lined with specimens of Chesapeake Bay life, many of which the youngsters preserved themselves with the help of students from St.

Mary's College of Maryland nearby. The walls are crowded with information and pictures about the bay.

And in an experiment to see how fast algae would grow, students set jars filled with varying amounts of fertilizer, ground water, pond water, and tap water under the windows.

They also wrote letters to various organizations, asking for information about the bay and about endangered species, which they then shared with the class.

At least 20 minutes each morning, the students write in journals. One day, they prepared questions to ask a visitor from the local nuclear-power plant, who came to discuss its effects on the bay. Another day, they brainstormed ideas for environmental bills based on their experiences.

Visitors find a classroom that is busy, crowded, noisy, and incredibly active.

"As a teacher, you often see children heading in one direction and wanting more information, and you have to go on to the next unit," Ms. Mattox said.

"Here," she added, "they have the freedom to explore. They can learn in their own way, based on their own interests. ... It really gives them a little bit more authority for their own education."

Diverse Groups

At Green Holly Elementary School, a few miles away, students on a recent day were wrapping up their group investigations. Each team of four students was assigned one of six subtopics, such as "soggy settings: wetlands, marshes, swamps, and bogs," or "home is a habitat: plants and animals on the bay." Based on suggestions from the teacher and team discussions, the children chose questions they wanted to investigate and a way to present their findings to the class.

The teams followed cooperative-learning methods developed by researchers at Johns Hopkins and by Shlomo and Yael Sharan, two Israeli experts in group investigations.

Each team included children of mixed abilities, races, and sexes. Within the teams, students determined how much to work together or alone and what type of research they wish to pursue, such as reading, interviewing, or viewing videotapes.

One group of students was busy producing a play called "No One Is Useless To Help the Wetlands." Another was drawing a large diagram listing the various animals living in the forests, shallow waters, and deep waters of the bay. Still other students crafted dioramas of ecologically sound campgrounds, maps of where they would place recreational sites along the Chesapeake, and posters of various seafaring vessels and their functions.

Echoing the comments of her peers at Lexington Park, Angela Legg, a Green Holly 5th grader, summed up the BayLab approach: "It's a lot of fun. You get to act like you're in real-life situations. You get to choose what you want to do."

"It's fun even to do the research," she said.

Teachers See Glitches

But the pilot project has not been without its glitches. Some science experiments bombed, according to the teachers. And Ms. Mattox, the Lexington Park Elementary School teacher, spent three days on a 90-minute lesson about government when she discovered that her 5th graders were unaware that governments print money and fund libraries.

One of the biggest problems is the paucity of materials about current events written at a level for children. "It's hard for them to find information," said Jeri Baumann, an energetic teacher from Green Holly Elementary.

"There's not a real lot written about the bay for this level."

In addition, researchers working on Roots and Wings discovered, students need more direct instruction about how to conduct research, from how to read a table of contents to the use of a card catalogue.

And while teachers have tried to extend their BayLab activities into math, language arts, and reading classes--by having the students write tall tales about the Chesapeake or create mathematical word problems based on it--such integration does not happen easily.

"Science and social studies do not always integrate naturally," one teacher complained. "It's like trying to mix oil and water."

After years of working alone, some students have had a hard time adapting to cooperative learning. And some teachers fret that the children are getting tired of their teams, which meet daily for 90 minutes.

Moreover, reaction to BayLab varies markedly by teacher. Although some say they are doing more hands-on activities than ever, others--who have spent years honing hands-on science curricula-- maintain they are doing less.

"We have had no science the whole last quarter of the year," said one teacher, who thinks that BayLab is too slanted toward the social studies. "All the hands-on science I've done for years is down the tubes."

`Hard To Evaluate'

Another question researchers are grappling with is how to evaluate what children are learning. As one teacher said: "It's all fun kinds of stuff. But the actual nitty-gritty type of learning--I hope they're learning as much as I think they are."

"It's hard to evaluate," agreed Sue Gough, a teacher at Ridge Elementary School. "Teachers are not sure they've done what they need to do--that they've covered all the areas."

During this first year of the project, the researchers let each teacher determine how to evaluate student progress. And, because the BayLab unit was only a pilot, they did not worry excessively about how it meshed with the scope-and-sequence curriculum required by the district.

But in the future, all involved in the project agree, such accountability is important and will probably include everything from student portfolios to daily checks on children's progress.

Ms. Mattox, for instance, gives each child a grade every day, even when students are working in groups.

"It's partly to let them know this is not just fun and games," she explained. "You have to have some kind of accountability with this much freedom. There's still a lot of control, even though there doesn't appear to be."

Older Students as Mentors

Indeed, for many of the teachers, this year has been a grueling one, involving hours of hard work, as they have struggled to adapt the materials developed by the Johns Hopkins team.
A group of seven teachers from the four participating schools meets weekly with the researchers to provide them with feedback. Some will also spend the summer helping prepare materials for next year, when the number of WorldLab units will be expanded and field-tested for younger students.

In addition, the researchers want to take advantage of an unexpected boon that they discovered this year: the use of middle school, high school, and college students as mentors and role models for the younger children.

For example, the model general assembly held in St. Mary's City was based on one that has been held for older students in the district for years; during the session last month, older students from the existing program served as chairmen for the legislative committees and walked the younger children through the experience.

And once additional thematic units are developed, it should be easier to mesh the curriculum with the rest of the youngsters' instruction and with the state's learning outcomes.

"We're building more structure into the program for next year," Ceil Daniels, the developer of BayLab's science component, said. "We want to integrate the language-arts curriculum more closely with what we're doing."

"With more structure," she added, "teachers will be able to cover more, move through more efficiently."

"It needs to be more teacher-friendly," Elfreda Mathis, the principal of Lexington Park Elementary School, agreed. "It's too much for one human being."

Yet, the scripted nature of the materials--which include detailed lesson plans and teaching techniques--could make some veteran teachers uncomfortable.

Adding to their stress, many BayLab teachers pilot tested other components of Roots and Wings, for full implementation this fall, at the same time that they worked on the science and social- studies curriculum.

But if life has been complicated for the teachers, that, too, is a lesson they want their students to absorb. "Children need to understand that we live in a complex world full of various systems--biological, social, political," Mr. Bennett, the expert on simulations, said, "and that these all interact with one another and they're interdependent."

"Children don't learn best when everything is totally isolated."

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Math Project Takes Wings

By Lynn Olson

Paul Scott strides to the blackboard and writes, "If the answer is 24, what is the question?" Forty 3rd graders, sitting in teams of four, pull out their calculators and begin scribbling on pads: What is 14 + 10? What is 24 - 0? How many is two dozen eggs? Working in their teams, the students try to come up with as many problems as they can. Scott and his colleague, Ann Rouse, circulate around the large, open classroom providing assistance.

The brain-teasing exercise is part of a mathematics curriculum that is being piloted in St. Mary's County, Md., as part of an ambitious effort to revamp elementary schools for the 21st century. In 1992, the New American Schools Development Corporation funded researchers from Johns Hopkins University, local teachers and administrators, and officials from the Maryland Department of Education to create "break the mold" schools that could be replicated nationwide.

Known as "Roots and Wings," the project's goal is to keep all children performing at grade level in the regular classroom. The program also pushes students to move beyond the basic skills by applying ideas and concepts to solve real world problems. (See Education Week, June 9, 1993.)

Four elementary schools in this rural community green Holly, Carver, Lexington Park, and Ridge Have volunteered to serve as laboratories for the project. Last year, teachers began introducing new methods for teaching reading and writing. They also began using an innovative social-studies curriculum that asks students to solve real-life problems by drawing on their knowledge of science, history, math, and the arts.

This year, 22 teachers are pilot-testing the math curriculum, known as "Math Wings," in grades 3 through 5. Next year, it will be expanded to grades 1 and 2.

Building a Bridge

Like the other components of Roots and Wings, Math Wings is designed to move students beyond the rote application of basic skills. The curriculum is based on the standards developed by the National Council of Teachers of Mathematics.

"Students enter school with a great deal of mathematical knowledge," argues Robert E. Slavin, the project director and a professor of education at Johns Hopkins. "They know about combining and separating, halves and wholes, and so on. What they need is a bridge between their pre-existing knowledge and the formal representation of this knowledge in mathematical symbols."

Math Wings is designed to provide that bridge through the use of hands-on materials, cooperative learning among students, and an emphasis on problem-solving.

Its classes come in two varieties. "Whole-class units" last four to six weeks and focus on a general concept, such as measurement. During the units, students work largely in teams of four that are mixed by skill level. A variety of hands-on materials and real- world problems exposes all youngsters to core mathematical ideas.

The daily routine includes "facts checks"- rapid-fire exercises to improve students' agility in addition, subtraction, multiplication, and division and problem-solving to develop higher-order skills.

Math Wings, Slavin says, "is meant to be a balanced approach. We're trying to have a program that emphasizes creative problem-solving and discovery, but that also insures that kids can get the right answers."

"People used to think you had to master the basics before you could talk about concepts," he adds. "We're saying that's exactly backward. Kids need to have the big picture of what these numbers are doing for them in the real world ... before they have any interest in how the numbers operate."

`All This Good Stuff'

In between the whole-class units, students spend two-week intervals working to hone their math skills at their own pace. During the "individual units," children work with a same-ability partner based on a skills inventory that is given before the unit begins. The teacher also provides mini-lessons to small groups of youngsters every day that are geared to their particular needs.

The innovative structure enables all students to become proficient at math, without holding back the entire class or limiting the exposure of less able students to the depth, breadth, and beauty of mathematics.

"What's happened in the past is our slower kids never got all this good math stuff the concepts, the exposure to problem-solving, the number sense that they're getting now," says Gail Holt, a Roots and Wings facilitator at Green Holly Elementary School, where Scott and Rouse team-teach.

On the day before the Thanksgiving break, Green Holly's walls are festooned with paper Pilgrims and cardboard turkeys. And most students already have one eye on the door. But Scott and Rouse are plowing valiantly ahead with a whole unit lesson in subtraction for their 3rd graders. This particular lesson is designed for use by a substitute teacher and so uses few manipulatives. But it follows the general structure of a Math Wings class.

During the first 15 minutes, the student teams take out their materials and then quickly do a series of problem-solving activities. Scott also has children write in their logbooks, daily journals that help students think and write mathematically.

Today, the children are given a sheet with a few word problems and their supposed answers and are asked to decide as a team whether the answers are reasonable. The first problem states, "Last year, Bert weighed 24 kilograms. Now, he weighs 35 kilograms. How many kilograms has Bert gained?" The answer on the paper says, "Bert has gained 59 kilograms."

The children spend a few minutes thinking. Then small heads converge around desktops and the discussion begins. "I think it doesn't make sense," says one boy to his team. "It's adding, when it's supposed to be subtracting." Another girl notes that Bert couldn't have gained 59 kilograms if he weighs only 35 kilograms in total. After a few minutes, Scott asks teams who think the answer is a reasonable one to hold their thumbs up, and those who think it's not to turn their thumbs down. A few students are asked to explain their team's reasoning.

The next 40 minutes of the class are devoted to "action math": active, whole class instruction by the teacher on the day's concept and the use of hands-on materials by the children. During one 4th-grade lesson on "number sense," for example, students use their spatial sense to estimate the number of raisins in an individual-serving-sized box. They measure the sides. Open the lid and eyeball the raisins lying on top of the heap. Shake the contents up and down.

Then, they collect data by counting the raisins in their boxes and recording and comparing the information for all of the boxes in the classroom. At the end of the lesson, the students are asked to look at the graphs on the walls and make predictions about the contents of other raisin boxes, based on the data they have gathered.

The last five minutes of the lesson are devoted to explaining the homework assignment, putting away the materials, and writing in logbooks, if the students have not done so earlier. Throughout the unit, nightly homework and periodic assessments keep track of how children are faring.

Team score sheets provide the groups with an incentive to work together and to support their less able peers.

`More of a Participant'

Sharon Cook, a 4th-grade teacher at Green Holly, says, "The kids are definitely more actively involved" than in a traditional math class. "There's more discussion going on between the students about what it is they're working on. If they have a problem, they can ask someone else on the team for help."

Signs on the wall urge students to rely on each other and not to ask teachers for help until they have exhausted other options.

"It's not that the content is different," says Diane Berry, another 4th-grade teacher. "It's just that it's presented in a different way that allows them to be more of a participant in what's going on."

Teachers particularly praise the almost daily use of hands-on materials that help students make the connection between the concrete and abstract worlds of mathematics. In addition to boxes of raisins, on any given day students may be wielding geometric solids, cubes, measuring spoons, protractors, dice, measuring cups, play currency, compasses, rulers, and thermometers.

Stephanie Haines, a 5th-grade teacher at Ridge Elementary School who first pilot-tested one of the fraction units last spring, says: "Eighty percent of it was hands-on stuff that the kids made and used and manipulated. Rather than telling the kids what the concepts were in the beginning, they had to discover the ideas for themselves."

"Those kids that usually had a difficult time in math seemed to understand and grasp this a lot faster," she says.

Self-Paced Learning

Today, Patricia Baltzley, the former president of the Maryland Council of Teachers of Mathematics who is spearheading the development of Math Wings, is visiting Green Holly to demonstrate a lesson from the individual units.

The units are based on an earlier model developed by Slavin and his associates at Johns Hopkins, called Team Accelerated Instruction, that stresses the self paced development of math skills.

As usual, Baltzley begins the class with an open-ended problem- solving exercise that the children do in teams. Then, she hands out a series of brown cardboard folders, one per student. Each folder contains an information sheet that reviews the skills the child will be working on, a set of practice pages and practice tests, and the answer sheets. Baltzley explains to the children that the information in their folders will differ.

Using the information sheets as a reference, the students work through the practice pages and the practice tests at their own pace, before taking a "mastery test" away from their notes. As part of the routine, children stop periodically to check their answers. Based on how they are doing, they either move on to the next practice page, continue with the one they are working on, or ask the teacher for help.

As the children continue to work independently, the teacher calls up small groups of youngsters for mini-lessons that last about 20 minutes each. Additional enrichment activities are available for students who progress at a rapid clip.

Theoretically, the structure enables teachers to zoom in on a child's strengths and weaknesses in an efficient manner. But teachers are nervous about the sheer mechanics of monitoring 25 children who progress at their own speed. They also worry about how much assistance nonreaders will need simply to make it through the written instructions.

Baltzley tries to be reassuring. And as she circulates around the room, helping individual students and chatting

quietly, it all looks rather effortless. The six teachers, who sit off to one side, take notes.

Frustrated Parents

The first year of Math Wings has not been without its glitches. The team scoring sheets, which were supposed to encourage and reward teamwork, were too cumbersome, discouraging some teachers from using them. Baltzley is going back to the drawing board to come up with a solution.

Some of the whole-class lessons could not be completed in 60 minutes or used too many manipulatives, leaving teachers feeling frustrated and overwhelmed.

But perhaps most troubling was the initial reaction from parents, who had not been prepared for how different their children's homework would look. "There were phrases used that parents didn't understand," says 4th-grade teacher Wendy Flaherty. Children were using calculators to tackle problems that they couldn't do on their own. "The parents didn't know how to do the homework, and it frustrated them," Rouse adds.

After parents expressed their dissatisfaction at a meeting of the parent teacher association, Green Holly decided to send home information packets before the start of each new unit that would include a glossary of terms. Researchers at Johns Hopkins have decided to develop similar materials for the program district wide. The packets will explain how Math Wings approaches a particular topic, such as division; include sample problems and their solutions; and explain terminology.

"It's a shift in the way mathematics has been done," Baltzley says, and, in retrospect, "we didn't do enough to pave the way for it."

Teachers are also struggling to master the cooperative-learning techniques that undergird Roots and Wings. And there are lots of management problems still to be resolved. Many of the student teams, for example, have not coalesced. As a result, some children are working steadily while others are sitting back and letting their partners do the work.

"We're still not getting that team cooperation going," says Scott, who pulled out a manual on the rudiments of cooperative learning recently and then worried whether he was the only one having problems.

A workshop this month was designed to address such concerns by focusing on some of the more sophisticated aspects of teamwork, such as how to reach consensus.

"It is a problem and one that we're just continuing to work on," Slavin says. "Some teachers are doing a beautiful job with it. Some are not. These teachers are trying to incorporate major changes in the curriculum at the same time as major changes in pedagogy, and it's a lot."

`Taking a Chance'

Despite the problems, teachers say the initial results have been encouraging. "When I went through my grade book," Scott says, "95 percent of my students made a C or above on the report card, and that is an increase over the last 10 years that I've taught math. So I think that the children are learning more."

Flaherty agrees. Out of the 25 or 26 students in her class, she says, only three earned less than a C last marking period, "and that's just incredible compared to what I've usually gotten."

"I find that my kids are more willing to take a chance," she says, "and say, 'Well, this is what I did to solve a problem,' even if they aren't correct." But she acknowledges that the process adds to her workload. "I won't lie and say that it's not overwhelming," she says, "because it is."

Students also seem to like the approach. One student, Kathleen, writes in her logbook: "What I like most about math class is it's fun. What I like least is it's hard." Amanda, another student, writes: "I like problem-solving because you get to add and minus. And you can think and have time to think."

As the students in Scott's class put away their materials for the day and prepare for the long holiday weekend, a few chat enthusiastically about the games they have played and the paper money they have used. Then, they put away their Pilgrim-shaped erasers and head toward the door.

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Family Ties

By Lynn Olson

Lexington Park, Md.

On a rainswept day, four parents and their children--ages 2 to 5--hunker down over some good books in the library of Green Holly Elementary School.

Taking out a small cage with a white mouse inside, Jeannine Finnacom, the school's family-support coordinator, talks to the children about pets. Then, as the kids circle around, she reads them The Pet Shop by Jack Ezra Keats.

Periodically, she pauses and throws out a question: "Do you see a cat in this picture? Where would you hide if you were a cat?"

The parents sit at a table a few feet away, worksheets in hand. As Finnacom models how to read aloud, they follow along on a check list: Did she give the name of the book? The author? Ask the children to predict what will happen next?

Later, as the children create make-believe pets out of paper bags, feathers, and glue, Finnacom talks to their parents about reading.

"Books will make the difference in your child's education," she predicts. "They'll help determine whether your child is comfortable at school. Those who are read to will flow more easily into the school curriculum."

"What if the only time you get to read is the half-hour before bedtime?" asks Lori Wyman, the mother of 5-year-old Morgan. Finnacom has a suggestion: "When you sit down for breakfast, always put some books on the table." And whatever you do, she adds, read yourself. "If you don't read, then no matter how good you are at reading to your children, they're not going to see it as a life style."

Armed with copies of The Pet Shop, the parents and children scatter around the room to practice reading aloud. On every table lie picture books, culled from Finnacom's personal collection.

The low-key encounter is part of the family-support component of Roots and Wings, one of nine design teams funded by the New American Schools Development Corporation to create innovative schools. A private nonprofit group launched by American business leaders during the Bush Administration,NASDC selected the design team from more than 600 competing proposals.

Each of the winning designs tries to strengthen the connection between schools and families--and between schools and other community organizations--in some fashion. But Roots and Wings is particularly interesting because of its ability to build on work that was already under way here in St. Mary's County, a sparsely populated rural community on the tip of Southern Maryland.

Its approach includes family-support coordinators, like Finnacom, and a family-support team at every school; school-based health clinics that operate one day a week at each site; after-school programs that combine tutoring with academic enrichment; and attempts to reach out to parents and children before they reach school age, like this morning's Books and Breakfast meeting.

"Traditionally, schools have been very child-focused but see the child in isolation," explains Barbara Haxby, a

family-support specialist at Johns Hopkins University. "I think this program has pushed the boundaries of how we look at schools and views family outreach as an essential part of getting children ready to learn."

A Helping Hand

Researchers at Johns Hopkins teamed up with educators from St. Mary's County and the Maryland State Department of Education to design Roots and Wings. It is being piloted in four elementary schools here, including Green Holly.

Roots and Wings is now in its third year, but many of the family- support components began more recently. For example, Finnacom and the other full-time family-support coordinators were only hired last year.

Other pieces of the design include research-based curricula in reading, writing, and mathematics that stress cooperative learning; an integrated science and social-studies curriculum, known as "World Lab," that uses simulations and role-playing to help children apply what they have learned; and a thematically based pre-kindergarten and kindergarten program. In addition, Roots and Wings uses one-to-one tutoring and flexible multi-age grouping to teach nearly all children in the regular classroom and insure they master the academic content.

But the glue of the family-support component is people like Finnacom. Although their precise job description varies depending on the needs of each school, family-support coordinators generally are responsible for three tasks: family education, the integration of community services, and direct intervention when problems arise.

For Beth Fedasz, the family-support coordinator at Ridge Elementary School, that's meant taking on duties far beyond what most schools will do. "I've helped people fill out job applications, helped them find housing, shoes, food, clothes, furniture," she says. She's taught a G.E.D. class for parents and arranged for a nutritional expert to visit their homes. She even helped one family figure out how to pay off a debt.

Finnacom makes home visits to families two or three times a week. "My initial reaction was, `She's going to tell me how to raise my child,'" recalls a single mother, who met with Finnacom recently to discuss her son's homework problems. "But after I sat and talked with her, it was much better. She was very positive. She put me at ease."

Finnacom helped the mother brainstorm ways for the 2nd grader to remember his homework and left behind some assignments for the coming week, in case he forgot. "I wish all the people I had to deal with at schools were that easy," the woman says.

A mother of six describes an attendance plan that Finnacom helped institute for her oldest daughter. "She brought me home, like, a schedule: Wake my child up at 7, go back in at 7:05 and try it again and then, if I have any problems, call up the school. So far, we haven't had to do that. I think the children understand that the school means business."

That point was driven home when Finnacom showed up one afternoon at 2 to escort the children to school even though the academic day was nearly over. "It gave me a chance to talk to somebody straight out," the mother adds. "I'm not used to people coming out to my house from the school. It's different, real different."

Family-Support Teams

But the family-support coordinator is not a lone agent. Each school has a family-support team whose job is to manage both prevention and intervention programs at the school site. The team focuses on attendance, coordination of outside social services, parent involvement, and student behavior.

By state law, each school in St. Mary's County already had a pupil-services team that met once a month to discuss children who were having academic difficulties. The team included the principal, the school nurse, the school counselor, and the referring teacher, as well as the district's psychologist and pupil-personnel worker.

Roots and Wings has built on that concept, turning each of the teams into a family-support team that meets at least twice a month. The teams develop an action plan for children whose family, behavior, or attendance problems interfere with learning. They also focus on prevention by increasing attendance and parent involvement at the school. After teachers reported that students were having trouble working in groups, for example, the teams helped develop a unit on conflict-resolution and listening skills that is integrated into the regular curriculum.

At some schools, family-support teams have organized parenting workshops, incentives for students to read with their parents 20 minutes a night, homework centers staffed by teachers and parents, and mentoring and tutoring programs that use community volunteers. At others, they've set up "welcome wagon" visits for families who are new to the school. Throughout the year, ongoing training sessions keep parents involved in the school's curriculum. There is also a building advisory committee, including parents, that helps shape policy.

A Community Perspective

Equally important, the family-support teams have become a vehicle for drawing other social-service agencies into the school. The local departments of health, social services, and juvenile justice now have a schedule of the meetings, as do two local youth-service agencies. Representatives from the groups regularly attend the meetings and can review individual student's cases. They have also developed a waiver form that allows them to exchange information about families. "The goal is to bring more of a community perspective into that team," says Lorraine Fulton, the director of student services for the school district.

The family-support coordinators have also played a pivotal role in expanding the extended-day programs at the four schools. Four days a week, for example, students can stay at Carver Elementary School until 4:20 P.M. for a program that includes homework assistance, tutoring, 20 minutes of silent reading, and recreation. There's a creative-writing club and a computer club on Tuesdays and Thursdays and free transportation home.

But the biggest change this year is the family-health center, which is open one day a week at each school. The St. Mary's County Health Department and the state education department contributed $50,000 each to support the clinic. It consists of a family nurse practitioner, a clerk, and a social worker, who are employed by the health department.

The school system provides space for the clinics, which are located in the health offices at Green Holly, Lexington Park, and Ridge elementary schools. At Carver Elementary, the clinic is a converted vestibule off the school gymnasium. State health department funds pay for a van to transport families to and from the clinics. The department has also allowed the clinics to pilot a new fee structure. A family of four earning up to $30,000 a year pays only $10 per visit. The full cost for a visit is $20.

The clinics provide a wide range of primary-care services, including immunizations and allergy shots, physical examinations, vision and hearing screenings, pregnancy tests, simple blood and diagnostic tests, and the treatment of chronic health conditions. The clinics don't offer family-planning services.

Right now, they're only seeing three or four people a day. But Edith Cuison, the family nurse practitioner, predicts that eventually she will see up to 20 patients daily. The clinics are a particular boon for the more rural parts of the county. Ridge Elementary, for example, is 35 miles down the road from the nearest primary-care physician.

Surveys have found that at least 17 percent of Maryland families do not have health insurance, a figure that is roughly comparable for St. Mary's County. A survey of local families with school-age children found that about 15 percent of the student population has some kind of chronic illness--ranging from bronchitis to diabetes--that could interfere with learning.

Unlike the schools, the clinics will be open 12 months a year, and most will operate from 10 A.M. to 6 P.M.
Replication Roadblocks

But despite the progress of the past year, the nagging question for the developers of Roots and Wings is how

much of the family- support component can be replicated at other sites: places that do not have NASDC funding or St. Mary's history of collaboration and partnership.

Maryland is one of the few states with an office of children, youth, and families, for example, and a mandate that state agencies collaborate on behalf of children. Even before the advent of Roots and Wings, the county health department funded half of the school nursing positions in the St. Mary's County public schools.

Moreover, the NASDC grant now pays half the costs of the full- time family-support coordinators. It also provides the transportation funds--$11,000 this year--for the after-school program.

Says Lawrence J. Dolan, a research scientist with Johns Hopkins: "When we think about how this is going to look in Memphis or Dade County, Fla., this particular area is going to look different everywhere we go because of the local history and resources."

"Compared to the curriculum, which we think will transport rather easily," he adds, "this will not."

The predecessor to Roots and Wings is a program developed by Hopkins researchers known as Success for All. It's designed to reorganize elementary schools in high-poverty areas so that all children are reading at grade level by the end of 3rd grade.

Success for All also requires a family-support component, but Dolan says it "varies tremendously from site to site." And unlike the model developed in St. Mary's County, there is no direct funding for family-support coordinators.

Dolan says it is unrealistic for Roots and Wings to require all schools to create family-health clinics or to pay for additional personnel. But the designers can insist on some guiding principles. For example, all schools will be expected to create a family-support team and an attendance program, particularly if their attendance rate is below 95 percent.

As is true in the curriculum area, researchers plan to offer specific strategies and materials that can be adapted to local sites. They include methods for increasing attendance, managing behavior problems, and working with parents, such as the Books and Breakfast meeting. Many of the family-literacy activities, in fact, were developed as part of the Success for All program.

Starting Slowly

Meanwhile, participants in St. Mary's County are struggling with their own problems. Both the adult-education component of the family-support model and the creation of programs for children from birth to age 4 have been slower to get off the ground.

"If there is one facet of our plan that has not made as much progress, it is our adult education," Dolan says. The local community college, for example, does not operate a g.e.d. program in the county.

The county already has a program for infants and toddlers, but it primarily serves those with physical handicaps. The four elementary schools participating in Roots and Wings would like to offer services to a wider array of children and families. They also want to increase the amount of time devoted to socialization and beginning literacy skills. Right now, most of the time at the infant-and-toddler centers is taken up with occupational and physical therapy.

Mary Blakely, the principal of Green Holly Elementary, says, "What we want to be is self-sustaining. That's why we've moved slowly in this area. And we want to reach all our families, not just the at-risk."

Lexington Park Elementary has begun a "Panda Cub Club" for the parents of children who are not enrolled in its pre-kindergarten program. The hope is to bring these parents and children into the school for some of its existing workshops on nutrition, health, and other subjects. Ridge Elementary applied for, but did not receive, a grant to work with 10 at-risk children under age 3 and their parents a few days a week on socialization and

beginning literacy. Carver Elementary held a town meeting last year on the need for high-quality, affordable preschool. It's existing pre- kindergarten program can serve only 20 students and has a long waiting list. Another town meeting on the subject is scheduled for this month.

Another problem is getting families to turn out for such events, even when they are offered. Finnacom sent home notices about the Books and Breakfast meeting to the parents of all 4-year-olds not involved in the school, Chapter 1 parents, and all of the parents of 1st through 3rd graders with younger children at home. She had hoped to attract at least a dozen families, but got only four mothers and one grandfather.

"We can offer things," she sighs, "but it's getting people in. I'd like to have 40 or 50 people here."

"There isn't a lack of interest on the parents' part," she adds. "There are needs out there that we don't really see. Last night, I was in a child's home where there were two kerosene lamps. That's not enough light to read by, yet we require 20 minutes of reading a night. So we're all learning. I don't think education ever has any clean answers."

At least for the parents who came this morning, the effort seems to have been worthwhile.

As Morgan peruses the books on a nearby table, her mother explains that she came because the pre-kindergartner loves to read. "We read all the time, mostly at night," Wyman says. "I came just to see if I was doing O.K. at reading. One thing I guess I have to do is to take my time. My problem is I try to rush her through books, mainly because I'm ready to go to bed."

Leilani Ramos, the pregnant mother of 4-year-old Stephanie, says: "I'm interested in developing reading in my children. My kids love reading. They always beg me to go to the library but it's so hard to pick the right material for them." Ramos has brought along her father, who also reads to the children at night.

"I think she was right," she says, gesturing at Finnacom. "The kids who read more, they just learn to do better in school." Education Week
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Ready To Soar

By Lynn Olson

Landon Cornett leans intently over his desk, comparing data with a classmate, one foot tapping in unconscious rhythm. For the past 15 days, Landon and other 5th graders here at Green Holly Elementary School have been nurturing peas, beans, squash, and corn from seed. Now, they're reviewing the results: What kinds of seeds sprouted first? Grew the tallest? Grew the least? Which seemed to need the most water?

Like a young plant, Landon soaks it all in. At the school he attended last year in Virginia Beach, Va., he explains, "We had science, but it wasn't as neat as this because here we get to do experiments and things. In my old school, basically we would just read about it, study it, and take tests."

"I think I'm learning more here," he adds, "because you learn about what it actually looks and sees and feels and sounds like with all the experiments. And with books you can't really do that."

This particular experiment, known as "CropLab," is part of Roots and Wings, one of nine designs for high-performing schools funded by the New American Schools Development Corporation. Business leaders founded the nonprofit corporation in 1991 at the behest of President Bush to support models for innovative schooling.

For Landon, a bright student with a keen curiosity, Roots and Wings has fulfilled its promise. It has given him

a solid foundation in mathematics and reading and the opportunity to soar.

In his old school, Landon admits, "I used to get bad grades because my attention would wander. I'd get done, and I'd be bored."

Twenty minutes down the road, Jessica Guy, a 4th grader at Ridge Elementary School, also participates in Roots and Wings. A self- possessed student who's quick to voice her opinions, she, too, relishes aspects of the program, particularly the chance to do research.

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Moore agrees, arguing that cooperative learning works well for some activities and some children but not for all. "Some children get too dependent on other children giving them answers," she asserts. "Some actually lose what independence they had."

Slavin, one of the nation's foremost researchers on cooperative learning, can cite studies demonstrating that it benefits students on both ends of the academic continuum. But in St. Mary's County, he notes, the initial commitment to cooperative learning was muted because schools were not asked to go through an extensive self-selection process before committing to the program. And that has been a problem.

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This year, she says, the groups are working well. But she still worries about whether there is enough enrichment for her daughter. "We all have to learn in a team-player kind of world," she admits, "but there has to be some space in there, too, for that independent kind of learning."

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Even so, she acknowledges, "It has worked wonderfully down in the lower hall, with the beginning readers." Moreover, her own students are reading more novels than in the past because of the resources the program has made available.

The results speak for themselves. In 1992, when the program began, many of the 2nd and 3rd graders at Ridge were still struggling with beginning reading materials. This spring, all of the school's 1st graders were reading at the 1st-grade level or higher, "so they will not have 2nd and 3rd graders reading in 1st-grade materials next year," says Madden of Johns Hopkins.

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Three years after its inception, Roots and Wings is slowly changing behavior and curriculum where it counts: in the classroom with children.
But the same tensions that were apparent when the program began reverberate today. Because its curriculum and pedagogy are crafted largely outside the classroom, by researchers, Roots and Wings must struggle to give teachers a sense of ownership. In the process, its creators have had to assess where to bend on their design and where to hold firm. And once-reticent teachers have had to learn to speak up for what they believe works--and what doesn't.

"I think the biggest pro is that kids are more active," says Baumann, Landon's social-studies teacher. "I think the resources that we've gotten--the books and things--have been wonderful."

But, she cautions, "It's really the people who are dealing with children on a day-to-day basis who know curriculum best and what children can do."

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Ready To Soar

By Lynn Olson

Landon Cornett leans intently over his desk, comparing data with a classmate, one foot tapping in unconscious rhythm. For the past 15 days, Landon and other 5th graders here at Green Holly Elementary School have been nurturing peas, beans, squash, and corn from seed. Now, they're reviewing the results: What kinds of seeds sprouted first? Grew the tallest? Grew the least? Which seemed to need the most water?

Like a young plant, Landon soaks it all in. At the school he attended last year in Virginia Beach, Va., he explains, "We had science, but it wasn't as neat as this because here we get to do experiments and things. In my old school, basically we would just read about it, study it, and take tests."

"I think I'm learning more here," he adds, "because you learn about what it actually looks and sees and feels and sounds like with all the experiments. And with books you can't really do that."

This particular experiment, known as "CropLab," is part of Roots and Wings, one of nine designs for high-performing schools funded by the New American Schools Development Corporation. Business leaders founded the nonprofit corporation in 1991 at the behest of President Bush to support models for innovative schooling.

For Landon, a bright student with a keen curiosity, Roots and Wings has fulfilled its promise. It has given him a solid foundation in mathematics and reading and the opportunity to soar.

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Scaling Up the Design

By Lynn Olson

After a three-year trial run in St. Mary's County, Md., Roots and Wings is about to soar nationwide. As part of the scale-up project launched by the New American Schools Development Corporation, four states and seven school districts have agreed to replicate one or more of the nine NASDC designs, Roots and Wings among them, in at least 30 percent of their schools over the next five years.

At least five of those sites--Cincinnati, Memphis, Philadelphia, Miami, and the state of Maryland--already have schools that are implementing a predecessor to Roots and Wings known as Success for All. That program reorganizes elementary schools that serve large numbers of disadvantaged students to insure that all children read competently by the end of 3rd grade.

Existing Success for All schools may choose to become Roots and Wings schools by adding elements to their program, such as WorldLab, an interdisciplinary social-studies and science curriculum. Roots and Wings encompasses the entire school curriculum, while Success for All focuses primarily on reading, writing, and family-support services. There are now some 200 Success for All schools nationwide.

Roots and Wings will also work with other schools in any of the 11 jurisdictions committed to the NASDC scale-up that meet its requirements for program adoption. For example, the principal must be committed to the program, and at least 80 percent of the teaching staff must vote to support it in a secret ballot.

"NASDC as a whole is now ferociously into the scale-up business, and we are operating ferociously along with it," says Robert E. Slavin, the Johns Hopkins University researcher who directs both Roots and Wings and Success for All. Over the next year, he anticipates that about 100 schools will join the network.

Funding Shortfall

Meanwhile, St. Mary's County will continue with the program but with greatly reduced support. NASDC ends its funding for all of the demonstration sites this spring. The Education Commission of the States, which is working with NASDC to disseminate the designs, has given $75,000 to St. Mary's County to support the program, but that is far less than it previously received. Local budgets are also tight. Although the school system expects to grow by more than 500 students next fall, funding will probably remain level.

And that means personnel cuts. This year, all four Roots and Wings schools have full-time family-support coordinators, who work with families to address problems that can interfere with learning. Next year, the same responsibilities will be dispersed among existing staff members, such as pupil-personnel workers and school counselors.

"We moved into this project knowing that we had the benefit that other systems did not have, by having some additional funding," says Joan Kozlovsky, the superintendent of the St. Mary's County public schools. "But the whole goal was to enable these projects to continue when the revenues were neutral, so we've been really cognizant of that throughout our efforts."

Slavin and his co-workers have promised to continue providing curriculum development, resource materials, and staff training for the four pilot schools in the county.

In addition, at least three more of the county's 16 elementary schools have expressed an interest in parts of the project, such as the MathWings and the WorldLab curricula. "What we'll be doing is matching their interests with those of the program," says Kozlovsky, "so that we do a very deliberate scale-up and integration of these efforts into the schoolhouse."

"We've made a commitment to do whatever it's going to take to keep the curricular aspect of the program fully up and running because we expect a lot of people to visit the schools," says Slavin, "and they need to see the curriculum in place and going full steam ahead."